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Studies in the Botany of the Southeastern United States.—II.

By John K. Small.

(Plate 212.)

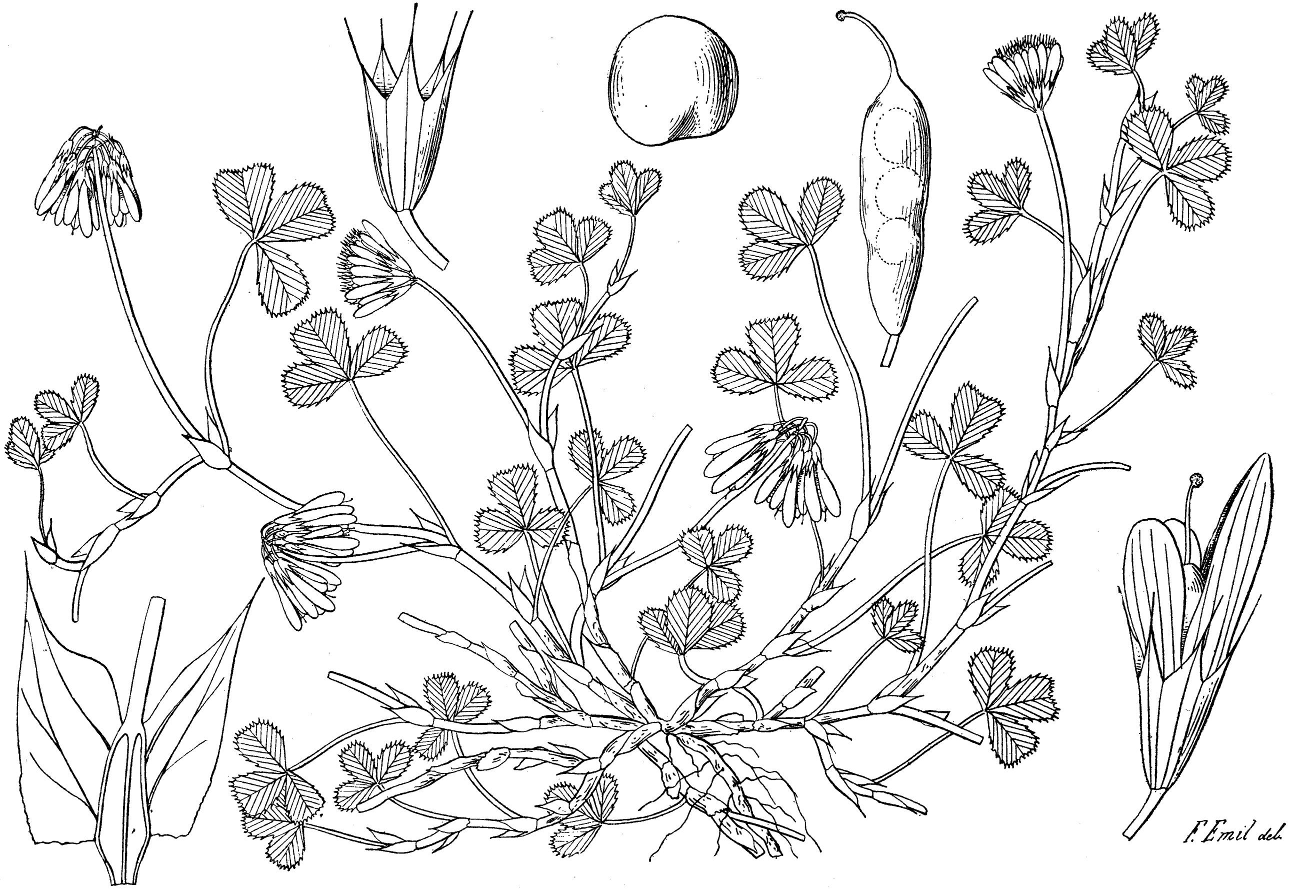
Isoetes melanospora Engelm. Trans. St. Louis Acad. Sci. 3: 395 (1877).

Up to the present time this *Isoetes* has not been known to occur at any but its original locality, Stone Mountain, Georgia, where Mr. Canby discovered it in 1869. During the past season I found it growing on Little Stone Mountain, Georgia, in shallow pools in the granite rocks, just as it occurs at the original station.

Xyris neglecta n. sp.

Annual, mostly strict, slender. Root fibrous; scapes usually two to four, sometimes one, 1–4 dm. long, ribbed with ten ridges, eight of which are arranged in pairs, two on either side of a line connecting the two most prominent ones, spirally twisted and sometimes slightly flexuous when old; sheath of the scape 4–6 cm. long, more or less reddish at the base; leaves linear, 3–10 cm. long, .3–.5 cm. broad, acute, straight or slightly curved, rather erect, 4–7-ribbed; flowers bright yellow, 3 mm. broad; petals irregularly erose; fruiting spike ovoid, 4–9 mm. long, acute; the scales orbicular-obovate, 3–5 mm. long, entire at the apex, imbricated in 6–7 rows; lateral sepal 4 mm. long, fimbriate-winged for ¼–⅓ of its length from the summit; seeds oblong, pointed at both ends, irregular in outline, furnished with tails equal to or longer than themselves.

Found by Mr. A. H. Curtiss growing in moist pine woods about Jacksonville, Florida, on August 11 and October 30, 1893, in company with *Xyris ambigua*, to which species it is related, but easily separated by its smaller size, shorter leaves and more slender spikes so far as the outside characters are concerned. The lateral sepal is also very differently crested and the seeds are smaller, narrower and more pointed. One of its strongest characters is the peculiarly ridged scape as described in the above diagnosis. The scape of *X. ambigua* is oblong in cross section and strongly two-ridged.



TRIFOLIUM SAXICOLUM SMALL.

SMILAX ROTUNDIFOLIA CRENULATA Small & Heller, Mem. Torr. Club, 3: 17 (1892).

Grows in similar localities at Tallulah Falls, Georgia, especially at the bottom of the deep cañon, as in the forests on Grandfather Mountain, North Carolina, the original station.* The plants are almost identical with the type and exhibit well the principal characters. The lanceolate leaves and the erose-crenulate margins are particularly striking. We now have this form from Southwestern Virginia, North Carolina and Northern Georgia, and may expect to find it at intermediate places along the mountains.

CELTIS RETICULATA Torr. Ann. Lyc. N. Y. 2: 247 (1825).

There exists in the valley of the Yellow River, about eighteen miles east of Atlanta, Georgia, a slender *Celtis* with remarkably small leaves and of a diffusely branched habit. In some respects it differs from any form yet described, but is nearest to *C. reticulata* Torrey, a species of the Southern Rocky Mountain region.

The specimens are so similar to that species that I consider it better to place it there than to describe it as new. This form agrees very well with Dr. Torrey's type, differing principally in the smaller and acute or acuminate leaves, which do not vary much from an inch in length. Those of the type specimens are mostly obtuse and some an inch and a half long. However, we have specimens almost identical with mine from Santa Cruz Valley near Tuscon, Arizona (Pringle), and cañons in the Burro Mountains, New Mexico (Rusby). The leaf form of the plant under consideration corresponds almost exactly with those collections.

At first I thought this form might be *C. pumila*, but an authentic specimen of Pursh's plant in the Columbia College Herbarium shows that it is a form of *C. occidentalis.*

PRUNUS NIGRA Ait. Hort. Kew. 2: 165 (1789).

In the Silva of North America, Prof. Sargent has reëstablished and given us a clear conception of this good species. I have recently (August 11, 1893) discovered a grove of this plum in the foothills of the Blue Ridge between Tallulah Falls and Toccoa

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* Mem. Torr. Club, 3: 17.

Falls, in Northern Georgia. The foliage, fruit, stone, etc., of my specimens are similar to those figured by Prof. Sargent in his Silva. The range given for the species extends only as far south as the valley of the St. Lawrence; however, the tree is probably more widely distributed than we are aware of, and we would naturally expect to find it in and about the Appalachian Mountain System.

The species is easily separated from *P. Americana* by its larger leaves, the larger and oblong fruit, and the strongly crested stone. The leaves of *P. Americana* are rather small, the fruit globose and the stone without a crest.

TRIFOLIUM SAXICOLUM n. sp.

Perennial by a strong root and numerous stolons, stout, glabrous, much branched from a woody base, procumbent, sometimes slightly ascending. Branches more or less creeping, the older portions becoming woody and covered with dry, membranous, chaffy stipules; internodes short, 3–17 mm. long, increasing in length towards the ends of the branches; leaves palmately-trifoliolate, numerous, rigid; stipules 6–8 mm. long, lanceolate, very acuminate, partly sheathing the branches; petiole .5–2.5 cm. long; leaflets obovate or obcordate, 3–8 mm. long, short-stalked, sometimes emarginate, with very sharp spine or prickle-like teeth except near the base, teeth sometimes double; secondary nerves straight and parallel, sometimes forking near the margin; peduncles five-angled, 2–6 cm. long; heads 40–70 flowered, rather dense; flowers white, drooping on deflexed pedicels in fruit; calyx narrowly-campanulate, 3 mm. long, cleft to the middle into fine subulate teeth, upper teeth shorter than the lower ones; corolla twice or thrice as long as the calyx when mature; vexillum undulate on the borders, erose at the apex; legume 2 mm. long, one to three-seeded, style persistent; seeds 1 mm. long, orbicular, ovoid, smooth, orange colored or reddish.

Found at the southern base of Stone Mountain, Georgia, growing in the loose piles of granite, altitude 1,100 feet. Not observed elsewhere in the mountain or vicinity. (Plate 212.)

The species is related to *T. Carolinianum*, but is separated from that and all our other species by its strong characters mentioned above.

TRIFOLIUM HYBRIDUM L. Sp. Pl. 766 (1753).

Although extensively naturalized and thoroughly established in the Northern States, this species has been slow in securing a hold in the South. So far as I can learn it has not been observed south of Virginia, except about the village of Stone Mountain, Georgia, when I found it well established last July.

CRACCA INTERMEDIA n. sp.

Perennial by a woody base, pubescent throughout and slightly viscid about the nodes. Stems 4–6 dm. long, branched from the base and throughout, spreading, assurgent, flexuous and more or less angled; leaves oblong-obovate in outline, 6–12 cm. long, 3.5–6 cm. broad; petioles 1–2 cm. long, rachis four-angled; leaflets 7–11, oblong-obovate, 1–3 cm. long, .7–1.7 cm. broad, strigose on the lower surface, glabrous on the upper surface, truncate or slightly emarginate at the apex, more or less apiculate by the excurrent midrib, very short petioluled; peduncles as long as the leaves, four-angled; pedicels 6–8 mm. long; flowers dark red, 1.3–1.7 cm. long; calyx teeth lanceolate, acuminate; legume 3.5–4 cm. long, either solitary or two arising from the same place; seeds five to nine, oblong or oblong-ovoid, compressed, smooth and variegated.

Intermediate between *Cracca ambigua* and *C. chrysophylla*, but of the two, more closely related to the latter, from which, however, it differs in its assurgent habit, the greater number and the shape of the leaflets, the smaller flowers and larger seeds. The habit of *C. chrysophylla* is strictly prostrate, the leaflets are 5–9 in number, and obovate-cuneate in outline. The seed is only one-half as large, dull and slightly roughened, and obliquely-obovoid in shape. *C. intermedia* also lacks the silky pubescence of *C. chrysophylla.*

The species grows in dry and poor "blackjack thickets" about Jacksonville, Florida, and was found by Mr. A. H. Curtiss in 1893, flowering on May 31st and in mature fruit on July 11th.

HIBISCUS SYRIACUS L. Sp. Pl. 695 (1753).

Is thoroughly established about Stone Mountain, Georgia.

PHACELIA DUBIA (L).

Polemonium dubium L. Sp. Pl. 163 (1753).

Phacelia parviflora Pursh, Fl. Am. Sept. 140 (1814).

PHACELIA HIRSUTA Nutt. Trans. Amer. Phil. Soc. (II.) 5: 191 (1833–37).

Phacelia parviflora var. *hirsuta* A. Gray, Proc. Amer. Acad. **10**: 320 (1875).

Last year I had an opportunity to study this plant in the field in both the flowering and fruiting state, and have been lead to the conclusion that Nuttall was right in considering it a species. In April I encountered the plant in flower on Stone Mountain, Georgia, where it grows at altitudes ranging from 1,000–1,400 feet, and in July in fruit. Being well acquainted with *P. dubia* the dissimilarity between the two forms was striking and in the living state *P. hirsuta* does not exhibit much likeness to *P. dubia.*

The plant is of a shorter and stouter build, erect and of a firm texture, and the racemes crowded even in fruit, whereas *P. dubia* is elongated, slender, spreading and with early interrupted racemes. The flowers and fruit furnish good distinctive characters: The corolla of *P. hirsuta* ranges from 13–15 mm. in breadth and the segments strictly entire, while that of *P. dubia* is only 8–11 mm. broad and has the segments more or less erose. The color of the former is dark purple, or, according to Nuttall, "purplish blue," and its pod is less compressed than the latter; the seeds are twice as large, covered with large papillæ. The pod of *P. hirsuta* is orbicular, rather broader than high, opposed to the broadly oblong pod of *P. dubia.*

PENTSTEMON SMALLII Heller, Bull. Torr. Club, **21**: 25 (1894).

Mr. E. P. Bicknell has lately discovered this handsome species at Nashville, Tennessee. He remarks that it grows plentifully on the bluffs of the Cumberland River about that city. Two forms were noticed and collected by Mr. Bicknell; the one has glabrous leaves as in the type, while in the other both the upper and lower surfaces of the leaves are canescent. I never noticed this latter character on any of the numerous plants observed and collected by Mr. Heller and myself in the mountains of North Carolina. It is probably due to local influences. The plants were in full bloom during the first weeks of May. The above collection extends the geographical range of this *Pentstemon* about two hundred miles to the west, Knoxville being previously the western known limit.

CUSCUTA ARVENSIS Beyrich; Hook. Fl. Bor. Am. **2**: 77 (1834).

Grows about the base of Stone Mountain, Georgia, in mats on *Gymnolomia Porteri*, where this species forms dense patches. There its color is not "pale," but a rather dark yellow. The young corolla, scales, etc., correspond to Mr. Matthew's figures;* but one corolla-segment is always narrower than the other four, sometimes only one-half as broad. This is probably a transition to a four-cleft state of the perianth which exists in some species. The filaments on the persistent corollas develop so as to appear as small segments, carrying out the fringed scale with them.

LONICERA FLAVA Sims, Bot. Mag. *t. 1318* (1810).

Heretofore only two localities for this rare and showy *Lonicera* have been known. According to Sims,† *Lonicera flava* was discovered by Mr. Fraser and his son on the exposed and rocky summit of Paris Mountain, South Carolina, noting that they failed to find it elsewhere. In 1836 Dr. Boykin found the species in the "upper districts of Georgia," but unfortunately failed to give any definite station. In April, 1891, Mrs. J. G. Smith rediscovered it at the original locality.

About the middle of April, 1893, I encountered the plant in full bloom on the summit of Little Stone Mountain, Georgia. This mountain is situated south of Stone Mountain, distant about nine miles. It is a flat, granite dome, rising about one hundred and fifty feet above the surrounding plain; the slopes are nearly bare, consisting of flat, granite pavements, but a small area of the top is capped by a layer of sandy soil several feet thick. This is covered by a rather dense growth of shrubs and trees, except the highest point, which is several square yards in extent. Here three plants of *Lonicera flava* grow, spreading over the undershrubs and the ground. The stems are covered with a loose, fibrous bark, and root freely at the nodes where they lie on the ground. It is a most handsome plant when in flower, the corolla being of a bright, golden color. On a second visit to that region in July the abundant fruit was just about maturing. During a month's exploration of the vicinty no other station was observed until my last trip on Stone Mountain, where I came upon several plants growing in the woods on the northern cliffs of the mountain.

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* Bull. Torr. Club, 20: *pl. 164.*

† Bot. Mag. *t. 1318.*

The species is evidently locally distributed, but will doubtless be found at new stations as the States of Georgia and South Carolina are better explored.

VIBURNUM FERRUGINEUM (T. & G.) Small, Mem. Torr. Club, 4: 123 (1894).

Mr. Bicknell recently brought me specimens of a *Viburnum*, from Nashville, Tennessee, saying that it was very different from anything he has previously observed and that no allowance was made for it in our manuals. It is typical *V. ferrugineum*, whose excellent characters I have pointed out in another place.* At Nashville it grows in the rocky banks of the Cumberland River in localities similar to the one on the Pinnacle at Cumberland Gap, where I rediscovered the species two years ago. Last season I also found many fine trees of this species in the bottom of a rocky cañon along the Yellow River, in Middle Georgia. The specimens from the latter locality, as well as Mr. Bicknell's, are identical with those from Cumberland Gap, in the Cumberland Mountains. The discoveries at Nashville and in Georgia do not increase the geographical range, but serve to show that the species is probably not scarce in the Southern States, but has simply been unobserved. All our Eastern specimens are very constant as to characters and habitat, the greatest variation being in the specimens from the Southwest. In these the leaves are smaller, more coriaceous and the tomentum on the petiole is more abundant.

VIBURNUM CASSINOIDES L. Sp. Pl. Ed. 2, 384 (1763).

This species was first found in the Southern States during the summer of 1891,† throughout the mountains of Western North Carolina. During the last season I encountered it first at Tallulah Falls, where it grows in the bottom of the deep cañon, and later along brooks throughout the mountains between the Tallulah River and the source of the Tennessee River, in Northern Georgia. It is the prevailing *Viburnum* in that region.

ERIGERON RAMOSUS BEYRICHII (Fisch. & Meyer).

Stenactis Beyrichii Fisch. & Meyer, Ind. Sem. Petrop. 5: 27 (1838).

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* Mem. Torr. Club, 4: 123.

† Mem. Torr. Club, 3: 6 and 27.

Erigeron strigosus var. *Beyrichii*, T. & G. Fl. N. A. 2: 175 (1843).

This rare and distinct form has lately been collected by Dr. Mohr in Alabama, growing on calcareous hills near Russelville. The plant was first found by Beyrich in "Carolina," and later discoveries show it to range from "Carolina" to Florida, St. Marks (Rugel) to Indian Territory, on the False Washita (Palmer, 479).

COREOPSIS INTEGRIFOLIA Poir. in Lam. Encycl. Suppl. 2: 353 (1811).

Fine specimens of a *Coreopsis*, which apparently belong to the above species, have been secured by Mr. A. H. Curtiss from the region between Jacksonville and Trout Creek, Florida. Authentic material of *C. integrifolia* is meagre, but I have carefully compared the Florida plants with it and find the two almost identical. The flowers, rays and styles are alike, and the leaves agree very well in shape, but those found by Mr. Curtiss have somewhat longer petioles. The plants grow on borders of wet thickets and were in flower and fruit on October 21, 1893.

A New Fossil Nelumbo from the Laramie Group at Florence, Colo.

BY ARTHUR HOLLICK.

NELUMBO LARAMIENSIS n. sp.

Leaf orbicular, about 1½′ in diameter, with wavy margin, centrally peltate; primary nerves strong, diverging somewhat irregularly from the centre, forked 1–several times, connected by cross-nervation which is slightly angled or bent outward, especially near the margin.

This little leaf was found in a collection of fossil plants made by Mr. George Hadden from the Laramie group at Florence, Colorado, for the late Dr. J. S. Newberry. Its affinities with the genus *Nelumbo* can hardly be questioned, and it is clearly different from every other fossil species thus far described from this country. In regard to the foreign species I can not be so certain, as some of these have been described or merely named but not figured, and